CATERPILLAR

Service Manual

301.6 MINI HYD EXCAVATOR

S/N BDH00001-UP

Printed by Heavy Equipment Manuals **Printed in U.S.A**
v2.20

Heavy Equipment Manuals

Product: MINI HYD EXCAVATOR
Model: 301.6 MINI HYD EXCAVATOR BDH
Configuration: 301.5 301.6 301.8 Mini Hydraulic Excavator BDH00001-UP (MACHINE) POWERED BY 3003 Engine

Disassembly and Assembly
301.5, 301.6 and 301.8 Mini-Hydraulic Excavator Engine Supplement
Media Number -RENR2803-01 **Publication Date -01/05/2005** **Date Updated -11/05/2005**

i00796496

Air Cleaner - Remove and Install

SMCS - 1051-010; 1054-010

Removal Procedure

Note: Put identification marks on all lines, on all hoses, on all wires, and on all tubes for installation purposes. Plug all lines, all hoses and all tubes. This helps to prevent fluid loss and this helps to keep contaminants from entering the system.

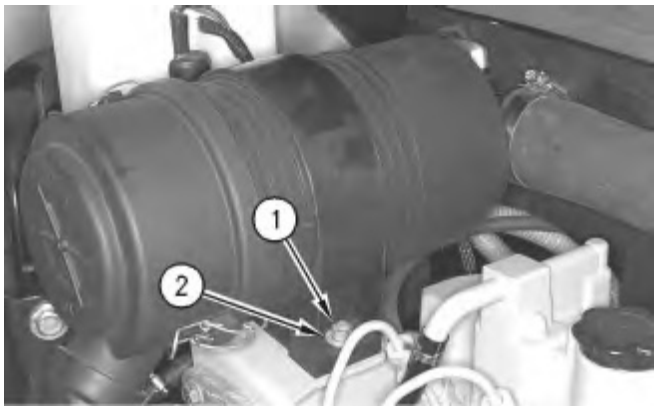

Illustration 1 g00374292

1. Remove two nuts (1) and remove two washers (2) .

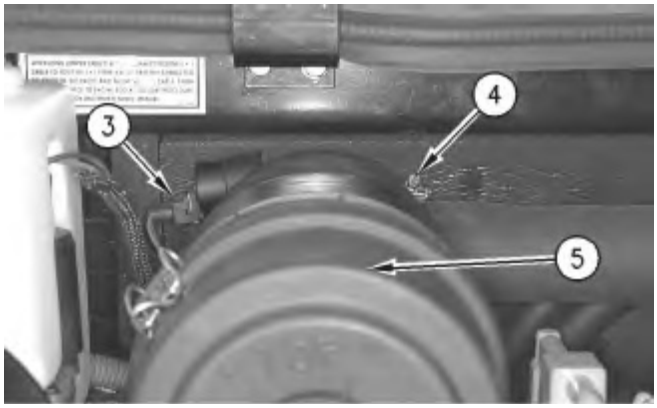

Illustration 2 g00374313

2. Remove electrical plug (3) .
3. Loosen hose clamp (4) .
4. Remove air cleaner (5) .

Installation Procedure

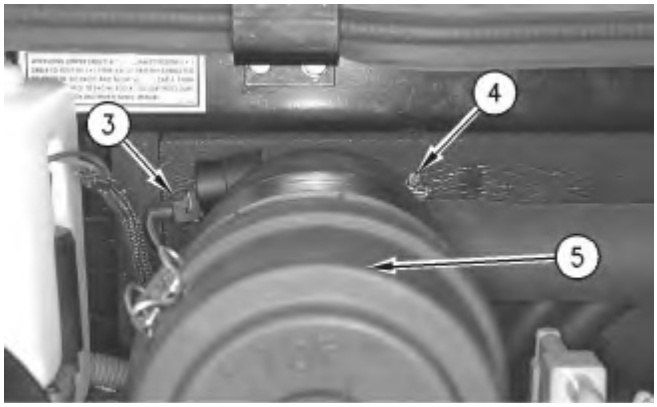

Illustration 3 g00374313

1. Install air cleaner (5) .
2. Install hose clamp (4) and tighten.
3. Install electrical plug (5) .

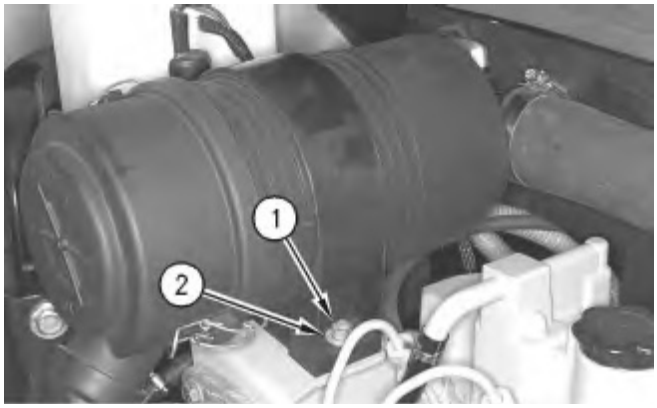

Illustration 4 g00374292

4. Install washers (2) and install two nuts (1) .

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Media Number -RENR2803-01 **Publication Date -01/05/2005** **Date Updated -11/05/2005**

i00912054

Alternator - Remove and Install

SMCS - 1405-010

Removal Procedure

Start By:

A. Remove the seat. Refer to Disassembly and Assembly, RENR2808, "Seat - Remove and Install" .
B. Drain the coolant. Refer to Operation and Maintenance, SEBU7152, "Cooling System Coolant (DEAC) - Change" .

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the machine. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, "Caterpillar Tools and Shop Products Guide", for tools and supplies suitable to collect and contain fluids in Caterpillar machines.

Dispose of all fluids according to local regulations and mandates.

Note: Remove the negative lead of the battery.

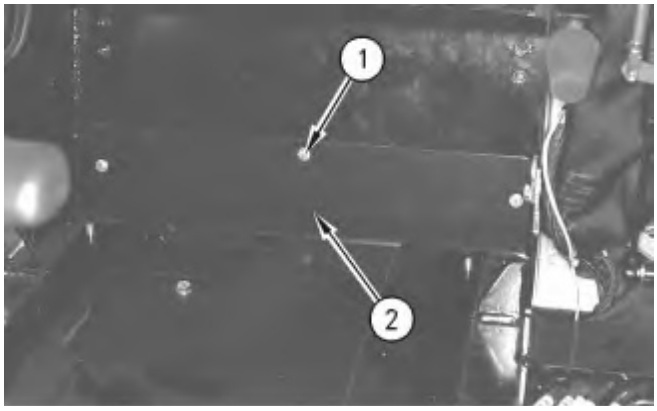

Illustration 1 g00465576

1. Remove six bolts and washers (1) .
2. Remove panel (2) .

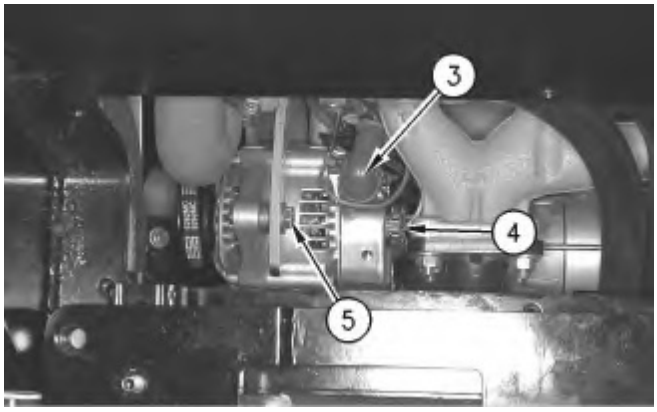

Illustration 2 g00465581

3. Remove electrical plug (3) .
4. Remove electrical plug (4) .
5. Remove the bolt and washer (5) .

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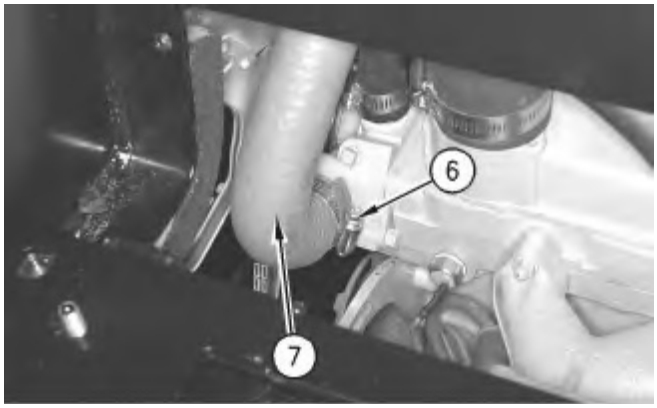

Illustration 3 g00465585

6. Loosen hose clamp (6) and position hose (7) away from the work area.

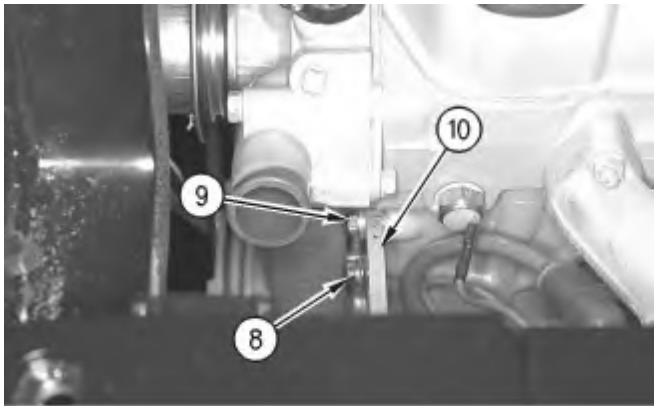

Illustration 4 g00465607

7. Remove the washer and bolt (8) .
8. Remove the washer and bolt (9) .
9. Remove bracket assembly (10) .

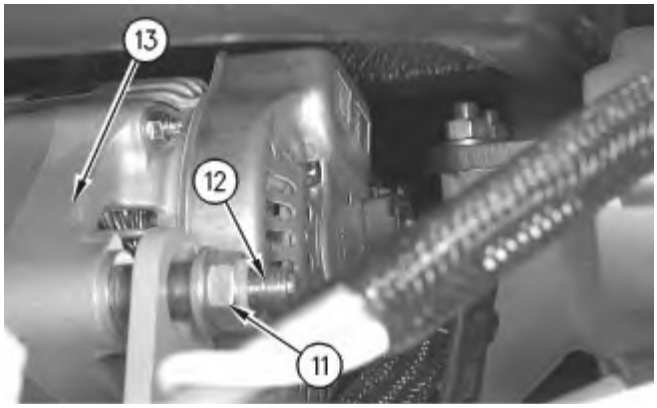

Illustration 5 g00465610

10. Remove nut (11) .
11. Remove bolt (12) .
12. Remove alternator (13) .

Installation Procedure

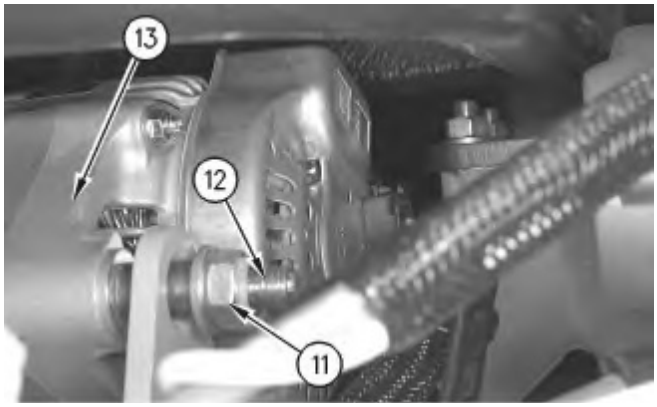

Illustration 6 g00465610

1. Install alternator (13) .
2. Install bolt (12) .
3. Install nut (11) .

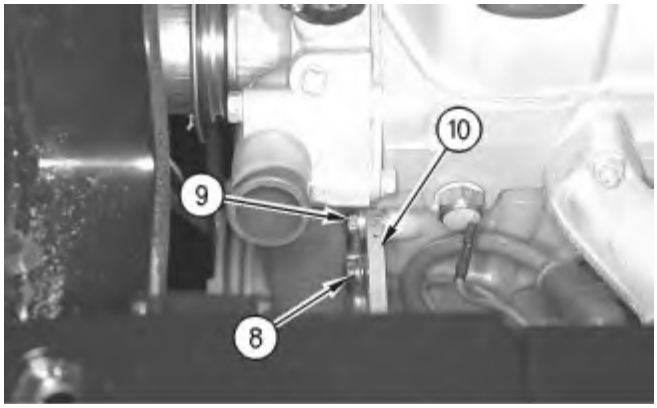

Illustration 7 g00465607

4. Install bracket assembly (10) .
5. Install the washer and bolt (9) .
6. Install the washer and bolt (8) .

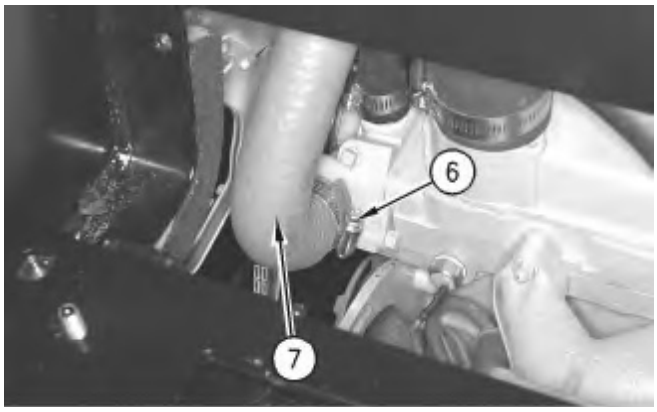

Illustration 8 g00465585

7. Install hose (7) and tighten hose clamp (6) to a torque of 3.5 ± 0.5 N·m (31 ± 4.5 lb in) .

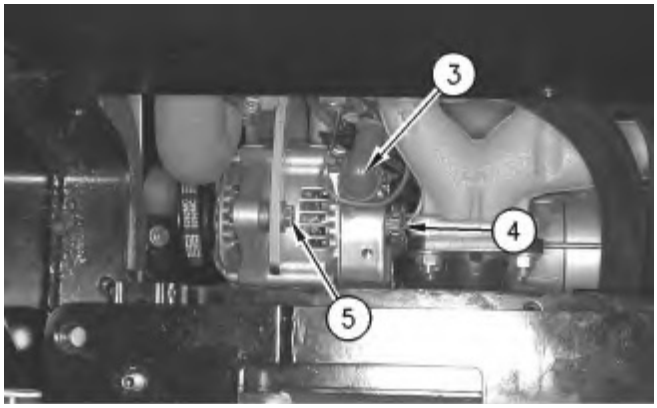

Illustration 9 g00465581

8. Install the bolt and washer (5) .
9. Install electrical plug (4) .
10. Install electrical plug (3) .

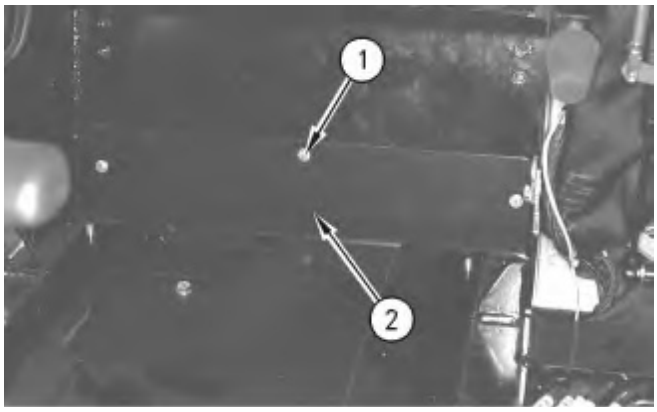

Illustration 10 g00465576

11. Install panel (2) .
12. Install six bolts and washers (1) .
13. Install the negative lead on the battery.

,,

End By:

a. Install the seat. Refer to Disassembly and AssemblyRENR2808, "Seat - Remove and Install" .
b. Fill with coolant. Refer to Operation and MaintenanceSEBU7152, "Cooling System Coolant (DEAC) - Change" .

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Media Number -RENR2803-01 **Publication Date -01/05/2005** **Date Updated -11/05/2005**

i00871784

Electric Starting Motor - Remove and Install

SMCS - 1453-010

Removal Procedure

Start By:

A. Remove the seat. Refer to Disassembly and Assembly, RENR2808, "Seat - Remove and Install" .

Note: Disconnect the negative lead on the battery before you work on the machine.

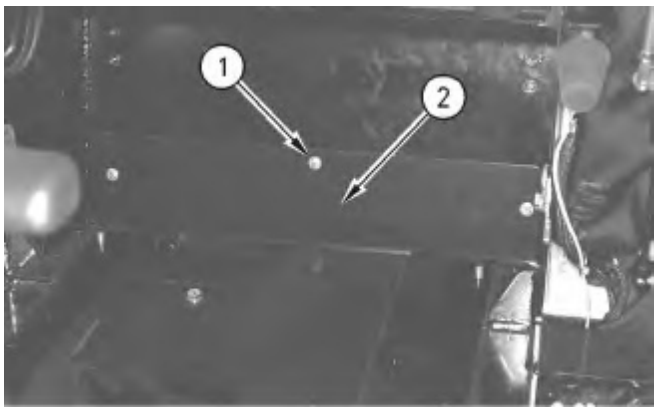

Illustration 1 g00441803

1. Remove six bolts and six washers (1) and remove access panel (2) .

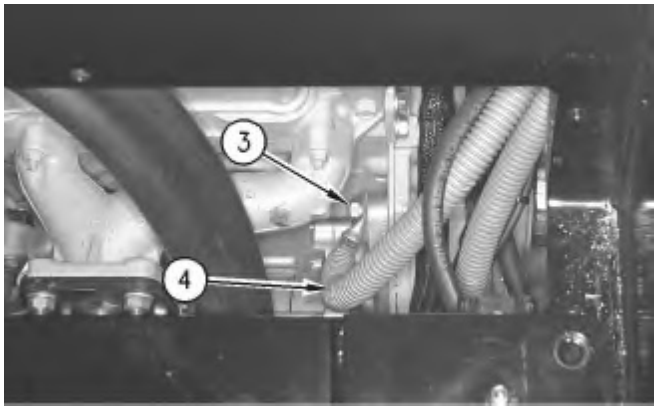

Illustration 2 g00441863

2. Remove one bolt and one washer (3) and remove battery cable (4) .

   Note: Perform the following three steps from the underside of the machine.

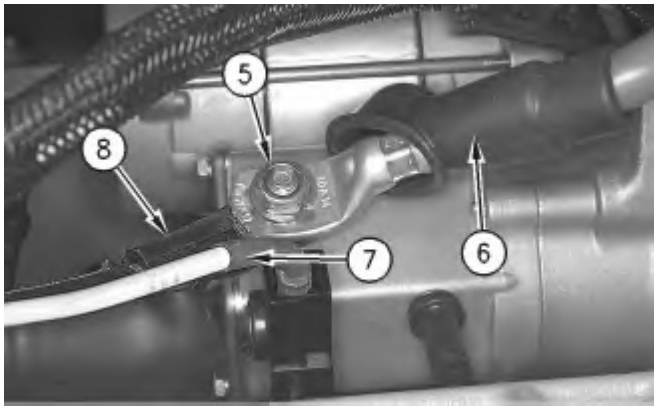

Illustration 3 g00441905

3. Remove nut (5) .
4. Remove electrical wires (6) , (7) , and (8) .

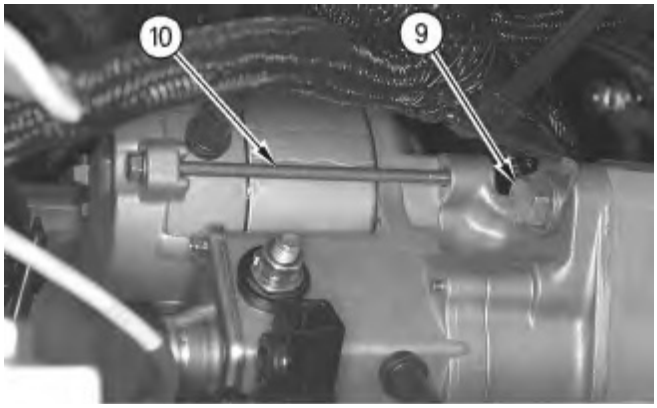

Illustration 4 g00441908

5. Remove one bolt and one washer (9) .
6. Remove electric starting motor (10) through the access panel.

Installation Procedure

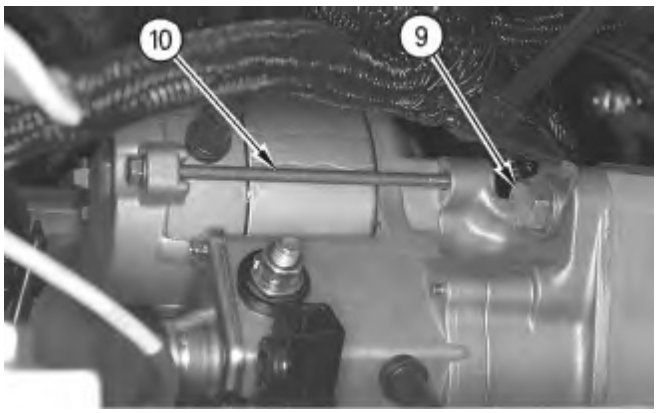

Illustration 5 g00441908

1. Install electric starting motor (10) through the access panel.

   Note: Perform the following three steps from the underside of the machine.

2. Install the bolt and washer (9) .

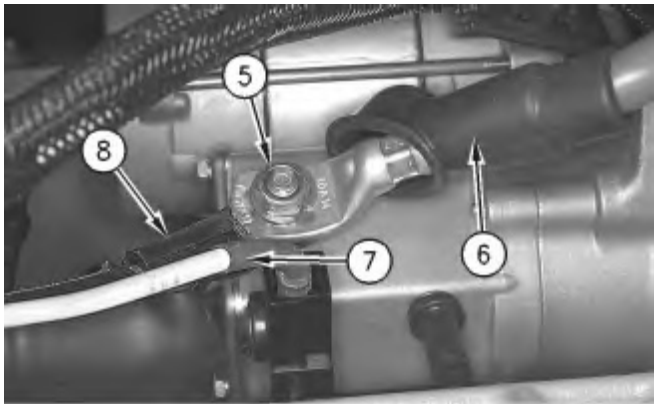

Illustration 6 g00441905

3. Install electrical wires (6) , (7) , and (8) .
4. Install nut (5) .

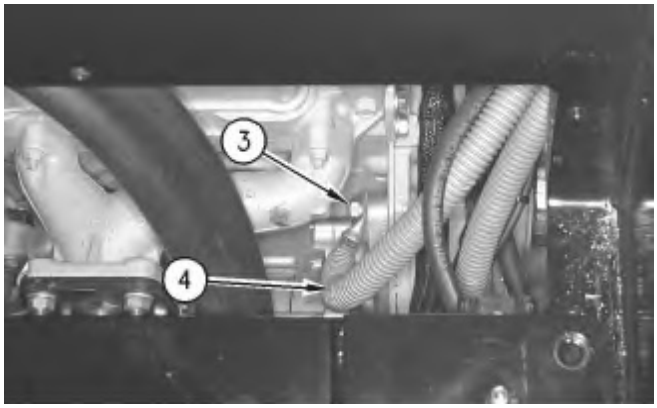

Illustration 7 g00441863

5. Install battery cable (4) and install the bolt and washer (3) .

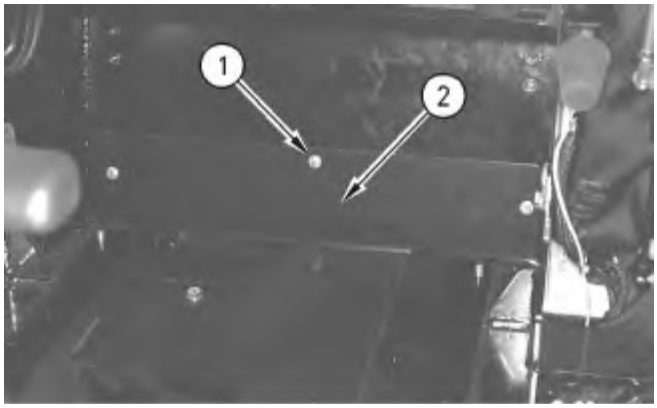

Illustration 8 g00441803

6. Install access panel (2) and install six bolts and six washers (1) .
7. Connect the negative lead on the battery.

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End By: Install the seat. Refer to Disassembly and AssemblyRENR2808, "Seat - Remove and Install".

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i00914441

Engine and Pumps - Install

SMCS - 1017-012; 1024-012

Installation Procedure

Table 1

Required Tools			
Tool	**Part Number**	**Part Description**	**Qty**
A	6V-2157	Link Bracket	2

WARNING

Personal injury can result from hydraulic oil pressure and hot oil.

Hydraulic oil pressure can remain in the hydraulic system after the engine has been stopped. Serious injury can be caused if this pressure is not released before any service is done on the hydraulic system.

Make sure all of the attachments have been lowered, oil is cool before removing any components or lines. Remove the oil filler cap only when the engine is stopped, and the filler cap is cool enough to touch with your bare hand.

WARNING

At operating temperature, the engine coolant is hot and under pressure.

Steam can cause personal injury.

Check the coolant level only after the engine has been stopped and the fill cap is cool enough to touch with your bare hand.

Remove the fill cap slowly to relieve pressure.

Cooling system conditioner contains alkali. Avoid contact with the skin and eyes to prevent personal injury.

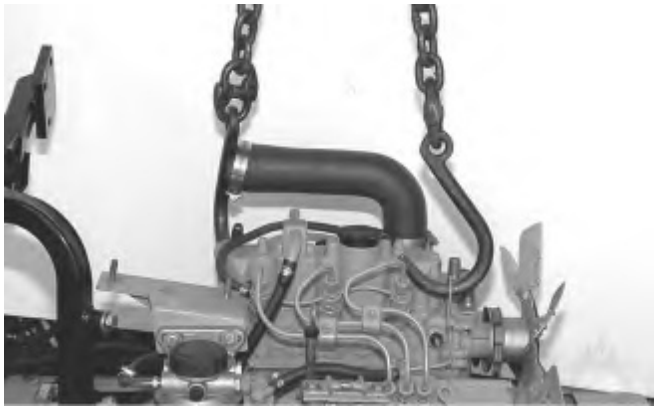

Illustration 1 g00489663

1. Apply suitable lifting chains to the lifting points on the engine. Apply enough tension on the chains in order to support the weight of the engine.
2. Lower the engine and pumps into position in the engine compartment. The weight of the engine and pumps is 125 kg (275 lb) .

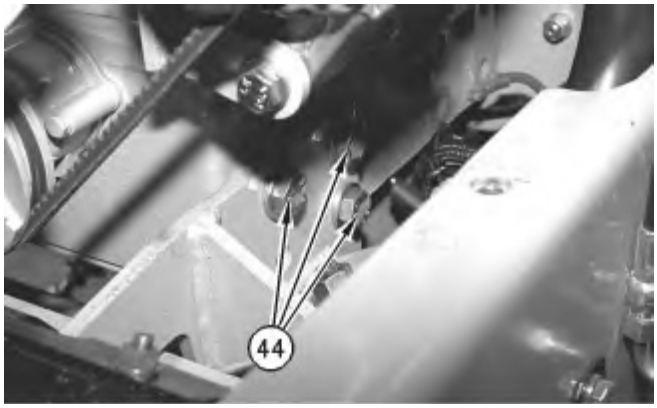

Illustration 2 g00489665

3. Install six bolts and washers (44) . The other three bolts are located on the rear of the engine.

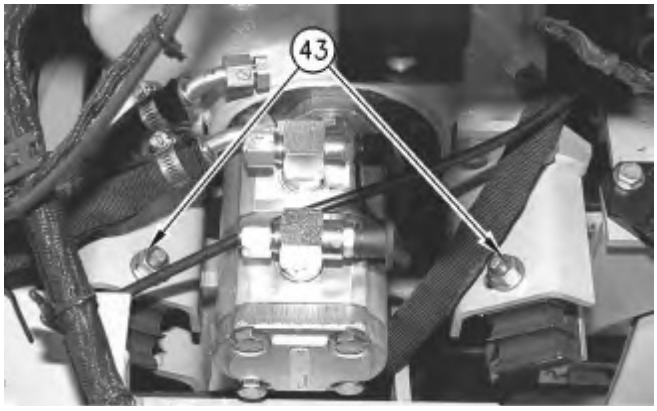

Illustration 3 g00489661

4. Install two nuts and two washers (43) .

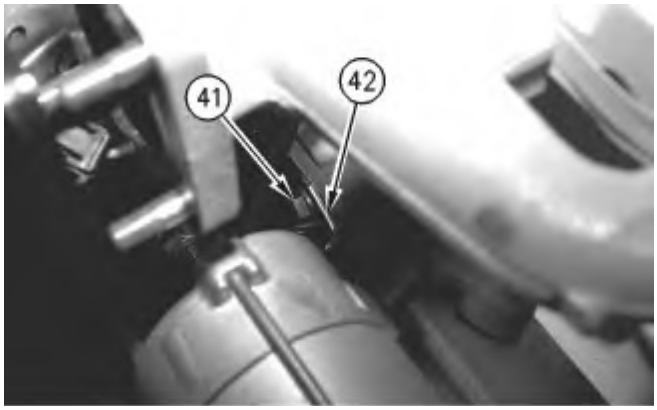

Illustration 4 g00489579

5. Install electrical clip (42) .
6. Install the bolt and washer (41) .

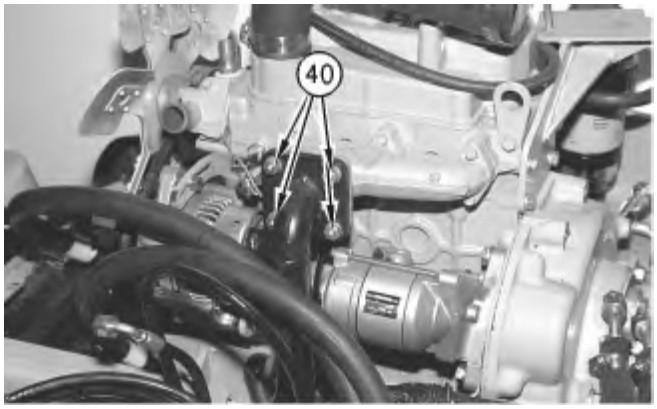

Illustration 5 g00489577

7. Install the exhaust manifold and install four nuts (40) .

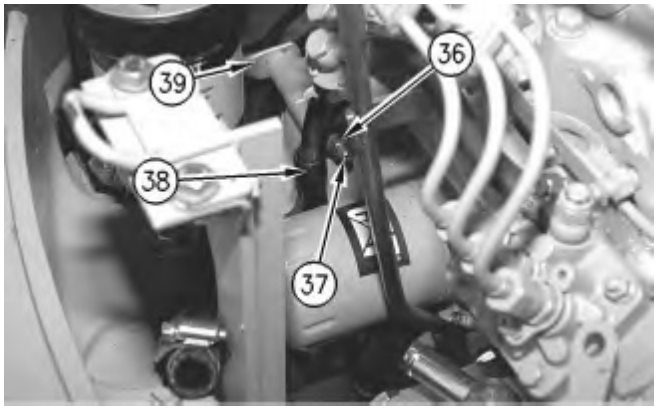

Illustration 6 g00489569

8. Install ground cable (39) .
9. Install clip (38) .
10. Install the bolt and washer (37) .
11. Install nut (36) .

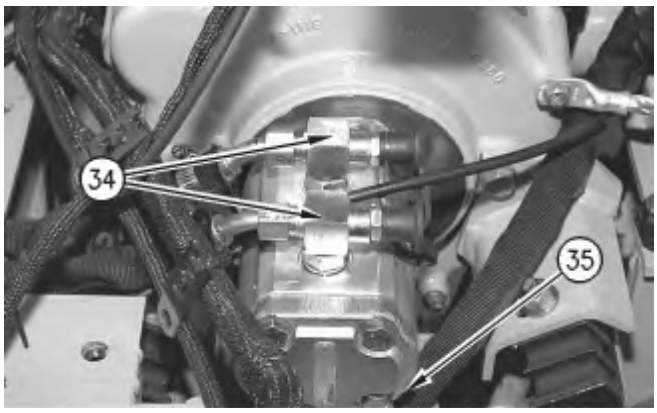

Illustration 7 g00489511

12. Install hose (35) and tighten the hose clamp.
13. Install two hoses (34) .

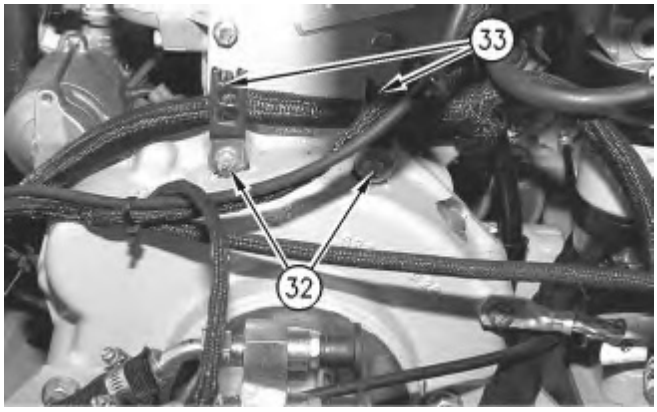

Illustration 8 g00489455

14. Install two electrical clips (33) .
15. Install the two bolts and washers (32) .

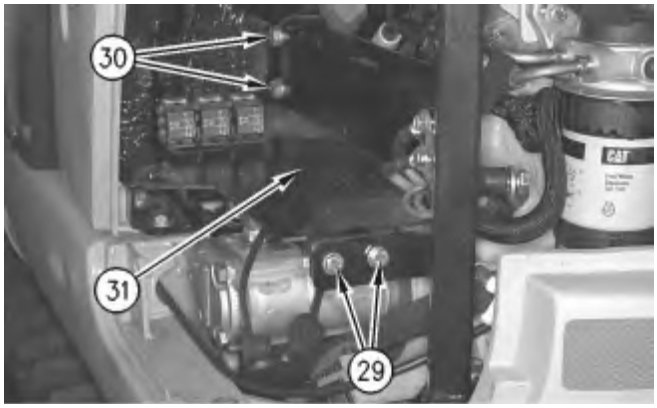

Illustration 9 g00489449

16. Install plate assembly (31) .
17. Install the wires. Install two bolts and washers (30) .
18. Install two bolts and washers (29) .

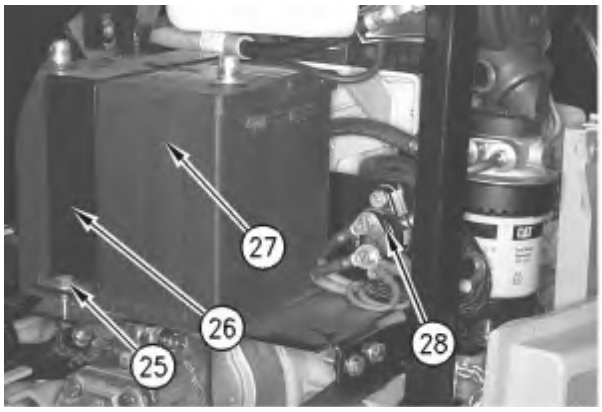

Illustration 10 g00489391

19. Install electrical reset (28) and install two bolts.
20. Install battery (27) .
21. Install battery bracket (26) .
22. Install the bolt and washer (25) .
23. Connect the battery cables.

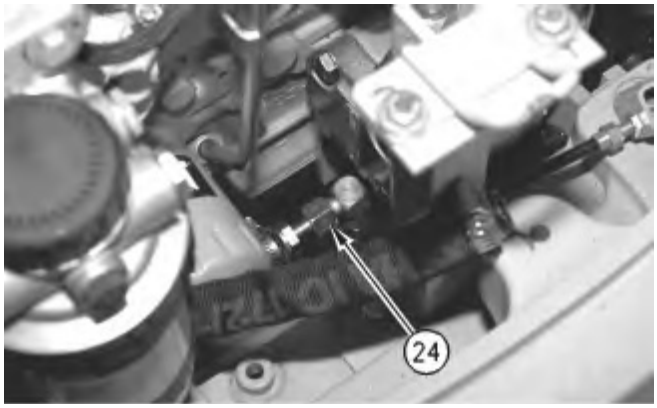

Illustration 11 g00489387

24. Install hose (24) .

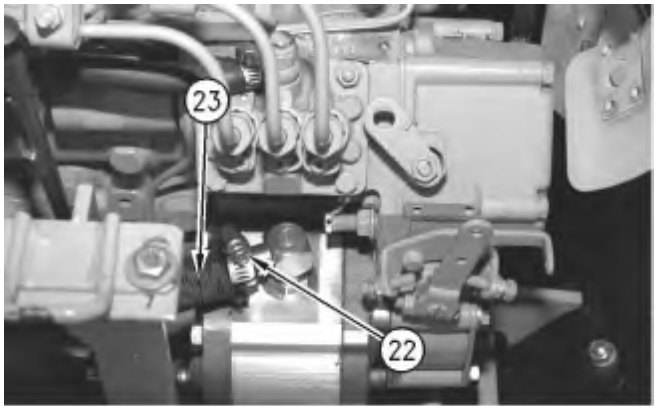

Illustration 12 g00489386

25. Install hose (23) .
26. Tighten hose clamp (22) .

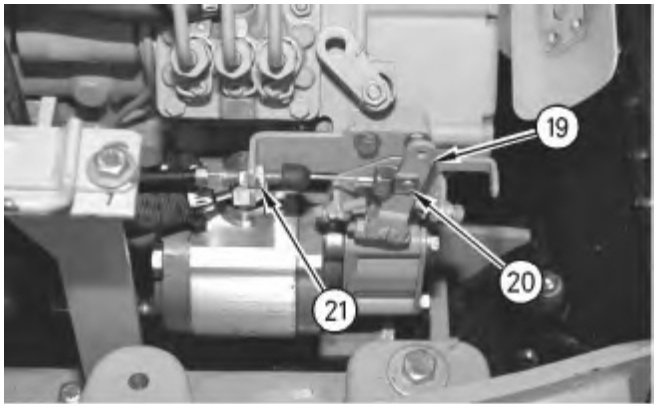

Illustration 13 g00489385

27. Place the engine throttle cable in position and tighten nut (21) .
28. Install pin (20) and install clip (19) .

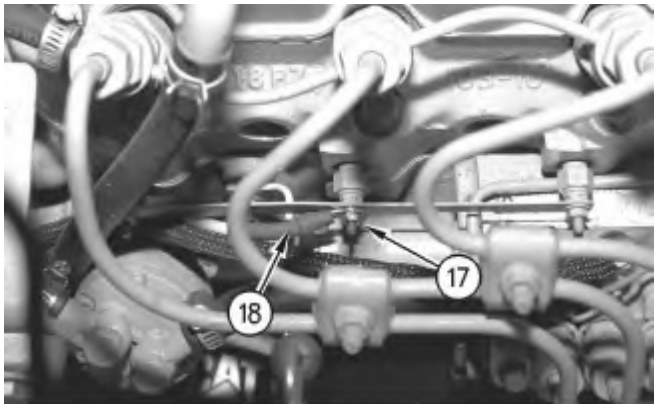

Illustration 14 g00489383

29. Install wire (18) and install nut (17) .

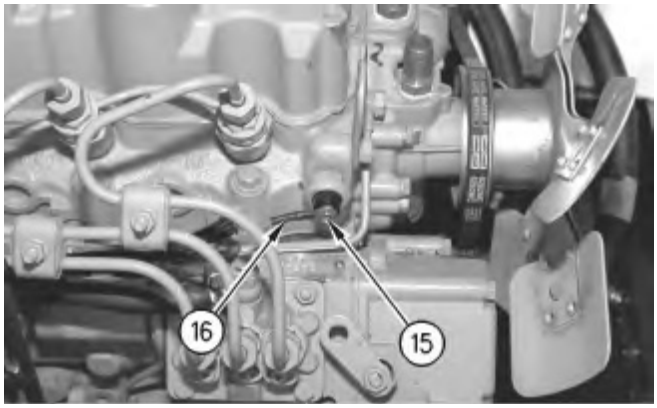

Illustration 15 g00489382

30. Install wire (16) and install bolt (15) .

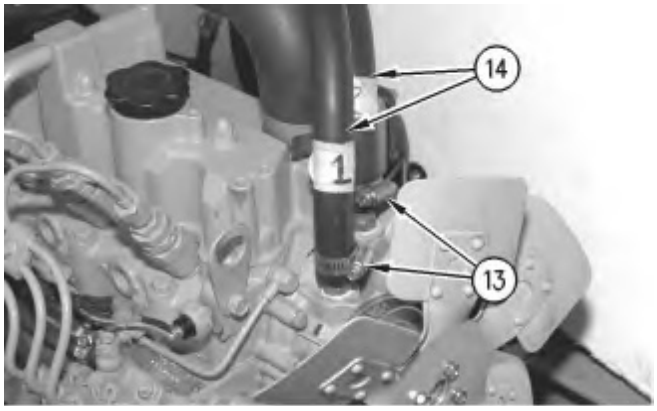

Illustration 16 g00489381

31. Install two hoses (14) and tighten two hose clamps (13) .

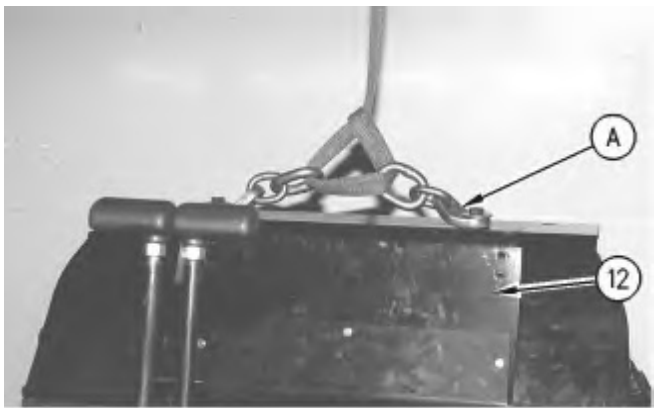

Illustration 17 g00489258

Note: The seat is removed for photographic purposes.

32. Install tooling (A) and apply suitable lifting straps.
33. Install wall plate assembly (12) .

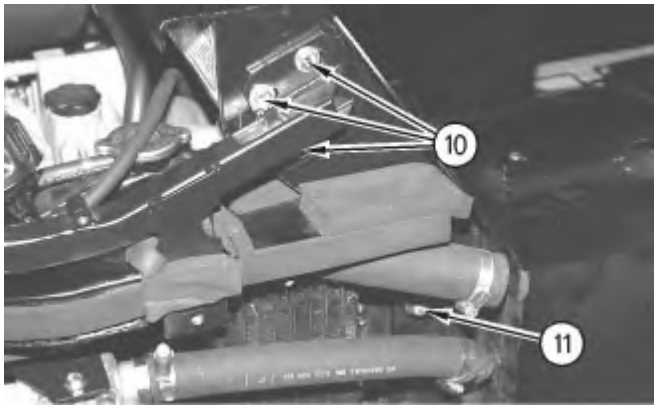

Illustration 18 g00489256

34. Install two bolts and washers (11) .
35. Install three bolts and washers (10) .

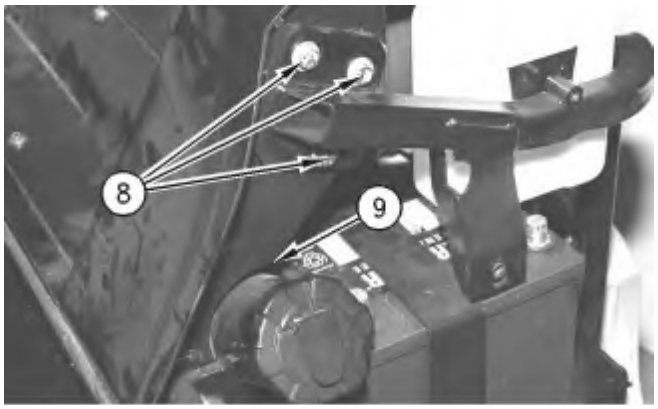

Illustration 19 g00489254

36. Install two bolts and washers (9) .
37. Install three bolts and washers (8) .

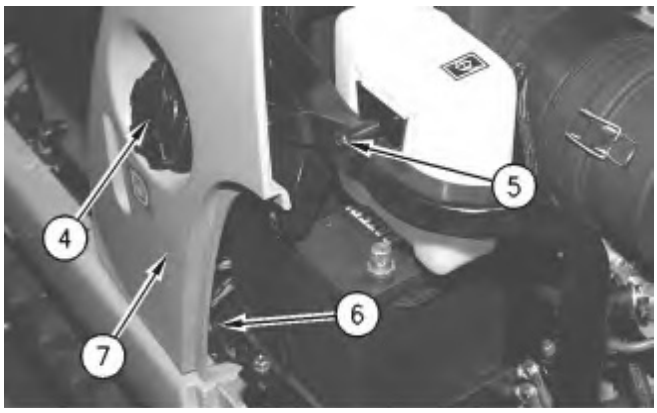

Illustration 20 g00489253

38. Remove fuel tank cap (4) and install side panel (7) .
39. Install the bolt and washer (6) .
40. Install bolt (5) .
41. Install fuel tank cap (4) .

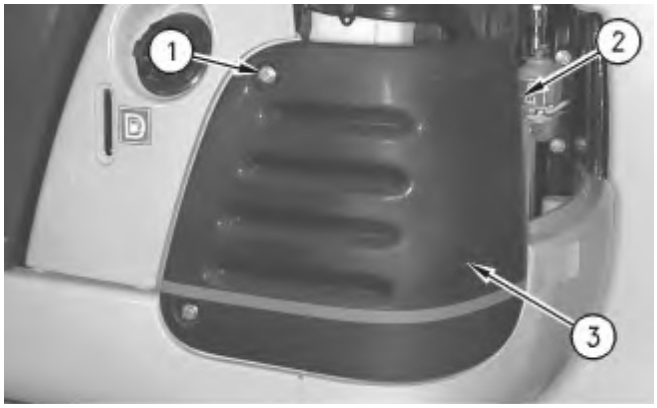

Illustration 21 g00465682

42. Install left side corner protector (3) .
43. Tighten two bolts (2) .
44. Install the two bolts and washers (1) .

,,,,,

End By:

a. Install the cab. Refer to Disassembly and AssemblyRENR2808, "Cab - Install" .
b. Install the alternator. Refer to Disassembly and AssemblyRENR2803, "Alternator - Remove and Install" .
c. Install the electric starting motor. Refer to Disassembly and AssemblyRENR2803, "Electric Starting Motor - Remove and Install" .
d. Install the radiator. Refer to Disassembly and AssemblyRENR2803, "Radiator and Fan - Remove and Install" .
e. Install the hood. Refer to Disassembly and AssemblyRENR2803, "Hood - Remove and Install" .

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Product: MINI HYD EXCAVATOR
Model: 301.6 MINI HYD EXCAVATOR BDH
Configuration: 301.5 301.6 301.8 Mini Hydraulic Excavator BDH00001-UP (MACHINE) POWERED BY 3003 Engine

Disassembly and Assembly
301.5, 301.6 and 301.8 Mini-Hydraulic Excavator Engine Supplement
Media Number -RENR2803-01 **Publication Date -01/05/2005** **Date Updated -11/05/2005**

i00914445

Engine and Pumps - Remove

SMCS - 1017-011; 1024-011

Removal Procedure

Table 1

Required Tools			
Tool	**Part Number**	**Part Description**	**Qty**
A	6V-2157	Link Bracket	2

Start By:

A. Remove the hood. Refer to Disassembly and Assembly, RENR2803, "Hood - Remove and Install" .
B. Remove the radiator. Refer to Disassembly and Assembly, RENR2803, "Radiator and Fan - Remove and Install" .
C. Remove the electric starting motor. Refer to Disassembly and Assembly, RENR2803, "Electric Starting Motor - Remove and Install" .
D. Remove the alternator. Refer to Disassembly and Assembly, RENR2803, "Alternator - Remove and Install" .
E. Remove the cab. Disassembly and Assembly, RENR2808, "Cab - Remove" .

WARNING

Personal injury can result from hydraulic oil pressure and hot oil.

Hydraulic oil pressure can remain in the hydraulic system after the engine has been stopped. Serious injury can be caused if this pressure is not released before any service is done on the hydraulic system.

Make sure all of the attachments have been lowered, oil is cool before removing any components or lines. Remove the oil filler cap only when the engine is stopped, and the filler cap is cool enough to touch with your bare hand.

WARNING

At operating temperature, the engine coolant is hot and under pressure.

Steam can cause personal injury.

Check the coolant level only after the engine has been stopped and the fill cap is cool enough to touch with your bare hand.

Remove the fill cap slowly to relieve pressure.

Cooling system conditioner contains alkali. Avoid contact with the skin and eyes to prevent personal injury.

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the machine. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, "Caterpillar Tools and Shop Products Guide", for tools and supplies suitable to collect and contain fluids in Caterpillar machines.

Dispose of all fluids according to local regulations and mandates.

Note: Put identification marks on all lines, on all hoses, on all wires, and on all tubes for installation purposes. **Plug all lines, all hoses and all tubes.** This helps to prevent fluid loss and this helps to keep contaminants from entering the system.

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